

Section 3-7 and 3-8: Recursive and Explicit Formulas for Arithmetic Sequences

Warm-up:

1. Find the first four terms of the sequence.

$$\begin{cases} S_1 = 10 \\ S_2 = S_{n+1} + 5, \text{ for int. } n \geq 2 \end{cases}$$

2. Write a recursive formula for the sequence 150, 130, 110, 90, ...

Arithmetic Sequence:

Theorem (Recursive Formula):

Example 1: Consider the sequence $\begin{cases} a_1 = 53 \\ a_n = a_{n-1} - 7, \text{ for int. } n \geq 2 \end{cases}$

a. Describe the sequence in words.

b. Find the first five terms.

Question: What will the graph of this look like?

Example 2: The town of Mitarnowskia has decided to add 20,000 acre-feet of water to its reservoir capacity of 3 million acre-feet and add 20,000 acre-feet each year thereafter. Write a recursive formula for capacity in n years.

Example 3: Find an explicit formula for the arithmetic sequence 12, 14.5, 17, 19.5, ...

Theorem (Explicit Formula):

Example 4: Find the 75th term of the arithmetic sequence 27, 28.5, 30, 31.5, ...

Example 5: The first row in an auditorium has 15 seats in it. Each subsequent row has 3 more seats in it than the row in front of it. If the last row has 78 seats, how many rows are in the auditorium?

Homework:

"It is impossible to defeat an ignorant man in argument." - William G. McAdoo